

Remarks

The Applicants have amended Claim 24 to recite that there are three separate phases. There is now an austenite phase at a volume fraction between 2.6% to 30%, a ferrite phase at a volume fraction between 10% and 60% and a martensite phase as the balance of the volume fraction of the phases. Support may be found throughout the Applicants' specification, such as in paragraph [0052] wherein martensite is indicated as being the primary phase. This is confirmed in the Applicants' Examples as reflected in Tables 2, 3 and 5, for example, wherein a composition comprising martensite, ferrite and austenite is shown with the various volume percentages all totaling 100%. Thus, since the Applicants have specified that the austenite phase is between 2.6 and 30% and the ferrite phase is between 10 and 60%, the martensite phase comprises the balance of the volume fraction. Entry into the official file is respectfully requested.

The Applicants note with appreciation the withdrawal of the objection to Claim 24 and the rejection under §112, second paragraph.

The Applicants acknowledge that the provisional rejection based on non-statutory obviousness-type double patenting has been maintained. The Applicants again request that further treatment of this rejection be held in abeyance.

Claims 24 – 34 remain rejected under 35 USC §103 over JP '009. The Applicants note with appreciation the Examiner's additional comments in support of the rejection. The Applicants respectfully submit, however, that JP '009 simply cannot be the basis for a rejection under §103. Reasons are set forth below.

As noted above, the Applicants' steel comprises three phases, namely an austenite phase at a volume fraction between 2.6 and 30%, a ferrite phase at a volume fraction between 10 and 60% and a martensite phase as the balance of the volume fraction. The Applicants respectfully submit that this is sharply different from the JP '009 steels. This is because JP '009 has a completely different objective. In that regard, JP '009 seeks to maximize the strength of the martensitic stainless steel and seeks to provide a dual-phase steel with a maximum amount of martensite and a minimal amount of retained austenite. This is discussed in paragraph [0010] of JP '009 which refers to a retained austenite amount of 10% or less in the high-strength martensitic stainless steel. This is repeated in the last sentence of paragraph [0025] in JP '009 which is line 1 of page 7 of the English translation of JP '009. Moreover, paragraph [0026] recites that the steel pipe has a tempered martensitic structure which contains retained austenite in an amount of 10% or less. Also, the amount of retained austenite is taught as being minimized because it is difficult for the phases to be stable and to secure high tensile strengths.

The Applicants proceeded in a completely different direction and do not seek to have steels with such a high volume fraction of martensite. Instead, the Applicants seek a steel that has a balance of austenite, ferrite and martensite. As a consequence, the Applicants' maximum amount of martensite, based on the austenite and ferrite phase limitations, is 87.4%. This is confirmed as noted above in various of the Applicants' tables, such as Table 2 wherein the amount of martensite ranges between 34.5% and 75.8%.

This is sharply contrasted to the steels of JP '009 which have far, far higher quantities of martensite which is in accordance with the objective of JP '009. This objective is factually demonstrated in the JP '009 table wherein there is a column for the amount of austenite which has austenite contents between 1.4% and 9.7% in the JP '009 inventive steels (steel Nos. 1 -- 10

and 17 – 20). Then, the adjacent column specifies the make-up of the steel so that it can be seen that the amount of martensite in steel Nos. 1 – 10 is 97.2, 97.9, 96.2, 98.1, 95.1, 90.3, 97.3, 98.6, 94.1 and 97.5, respectively. Then, in steel Nos. 17 – 20 the amount of martensite is 96.9, 96.4, 97.3 and 97.9, respectively. This amount of martensite far exceeds the amount of martensite claimed by the Applicants. That is because JP '009 intends to maximize the amount of martensite, while the Applicants' objective is to reduce the amount of martensite so that there is an ample amount of austenite and ferrite present to achieve the goals of having superior corrosion resistance, yield strength and the like.

The Applicants respectfully submit that, contrary to the rejection, they have supplied facts on the record that demonstrate material differences between the stainless steels of JP '009 and the Applicants' stainless steels. The rejection notes that the scope of JP '009 is not limited to the specific embodiments. The Applicants agree. However, the specific embodiments provide guidance to those skilled in the art as to what would reasonably be expected. Moreover, the rejection also refers to an "absence of evidence" on the record. The Applicants respectfully submit that there is plenty of evidence on the record. The rejection speculates that because of "similar" compositions and "similar" methods, the stainless steels would be expected to be the same. The Applicants have factually demonstrated by reference to the prior art and to their own specification that there are significant, material differences between the stainless steels.

As a consequence, when one consults MPEP 2112, as suggested in the rejection, it can be seen that the requirement for "expected" characteristics, i.e., inherent characteristics, the standard for establishing such expected characteristics or inherent characteristics is quite high. When applying that standard, it can be seen that the rejection is based on speculation as a result of "similar" compositions and "similar" methodology. On the other hand, the Applicants have

provided factual evidence on the record of the actual differences between the steels of JP '009 and the Applicants' steels. The Applicants respectfully submit that factual evidence on the record trumps speculation and when MPEP 2112 is applied, it can be seen that JP '009 simply is inapplicable under §103.

However, there are additional important differences. When equation (2) in the Applicants' Claim 24 and equation (1) in Claim 1 of JP '009 are compared, although there are some differences in their coefficients, they are almost the same. That is to say, according to equation (2) in Claim 24, the coefficient of C is 43.5, Mn is as high as 0.4, N is as low as 9, whereas Cu is 0.3 which is not disclosed in JP '009 and, therefore, the values calculated by equation (2) in Claim 24 inevitably are lower than the values calculated by equation (1) in Claim 1 of JP '009. In the attached comparison table, A* of Steel No. K in Table 1 of JP '009 is 11.52, whereas the value calculated by using equation (2) in Claim 24 is 11.457 --- which is rather lower.

Therefore, equation (2) in Claim 24 and the left side member of equation (1) in Claim 1 of JP '009 can be regarded as substantially the same. That is to say, JP '009 employs component equation (1) for the purpose of securing high strength and toughness. To prevent generation of ferrite according to equation (1) in JP '009, the maximum value is limited to 10 in equation (1). Equation (1) was developed under the fundamental proposition that a value is set to be not more than a certain amount (herein, 10), wherein the value is obtained from a calculation consisting of ferrite forming elements (Cr, Mo and Si) minus austenite forming elements (C, N, Ni and Mn), whereby the components of the steel are controlled to be in a range with which the ferrite is able to be prevented from forming. In fact, of the Examples, ferrite is included in Steel Nos. K, N and P, which are outside the range specified by equation (1) of JP '009 as shown in Table 2 of JP

'009. The structure of the Applicants' steel wherein the value of equation (1) is 10 or less, is composed of tempered martensite and austenite, as shown in Table 2. In other words, seeing that the steel satisfies equation (1) of JP '009, the structure of the steel is tempered martensite and austenite and therein no ferrite is included.

On the other hand, Claim 24 recites an equation which is similar to equation (2) of JP '009 (because values are obtained by experiments, coefficients slightly vary as the basic component range changes, however, the concepts are fundamentally the same), and the minimum value (herein, 11.5) is specified so that ferrite of a fixed amount becomes precipitated. In other words, equation (2) of Claim 24 specifies a value wherein the value is obtained from a calculation consisting of ferrite forming elements (Cr, Mo and Si) minus austenite forming elements (C, N, Ni and Mn) to thereby control the component of steel to be at least a certain amount (herein, 11.5). This is an opposite approach from the approach of JP '009. Because ferrite is positively recited in Claim 24, the composition is limited so that at least a fixed amount of ferrite is precipitated without fail.

This is set forth in the Applicants' specification in paragraph [0020], wherein if the value of left side member of equation (2) in Claim 24 is less than 11.5, precipitation of the ferrite phase becomes insufficient and hot-workability is insufficient, whereby manufacturing the seamless steel pipe becomes difficult.

From the foregoing, it is understood that the left side member of equation (2) in Claim 24 is prescribed as 11.5 or more whereas the left side member of equation (1) of Claim 1 of JP '009 is prescribed as 10 or less. As a result, the ranges of the equations specified therein are completely opposite.

Further, formation of ferrite is suppressed in JP '009 and as is set forth in column 5 of page 4 in paragraph [0018] pertaining to an explanation on the reason for the addition of Mo, the formation of ferrite is prevented on the basis of common knowledge that formation of δ ferrite exerts a harmful influence. Out of the inventive examples of JP '009, any of Steel K, N and P, wherein ferrite is formed, in Table 2 does not satisfy the required feature and the object of JP '009 was devised with the thought of suppressing formation of ferrite on an extension of conventional common knowledge.

Therefore, steels which satisfy the equation of JP '009 do not satisfy the equation of Claim 24. From the foregoing, the steels recited in Claim 24 and those in JP '009 are completely different. Withdrawal of the rejection is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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JP2000-4009

	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	(1)式	(2)式	M	τ	α	YS	Cu
min.	0.005	0.05	0.2			15.5	1.5	1	0.02	0.01		19.5	11.5	10	2.6	10	654	
max.	0.05	0.5	1.8	0.03	0.005	18	5	3.5	0.2	0.15	0.006			97.4	30	60		
JP2000-4009																		
	C	Si	Mn	P	S	Cr	Ni	Mo	V	N	O	(1)式	(2)式	M	τ	α	YS	Cu
A	0.026	0.19	0.51	0.02	0.001	13.4	4.34	0.44	0.051	0.076	0.002	15.965	7.538	97.2	2.8		948	
B	0.024	0.28	0.43	0.01	0.001	12.7	3.54	1.1	0.034	0.025	0.005	15.181	8.903	97.9	2.1		960	
C	0.027	0.23	0.45	0.01	0.001	13.4	3.68	1.29	0.052	0.037	0.005	16.076	9.3915	96.2	3.8		920	
D	0.01	0.31	0.42	0.02	0.001	12.7	5.13	2.49	0.041	0.062	0.004	17.3285	8.992	98.1	1.9		984	
E	0.021	0.2	0.45	0.02	0.001	13.1	5.06	0.88	0.038	0.038	0.004	16.497	7.5445	95.1	4.9		913	
F	0.017	0.22	0.44	0.02	0.001	13.4	3.75	0.93	0.042	0.063	0.003	16.0655	9.1635	90.3	9.7		867	
G	0.025	0.24	0.61	0.02	0.001	13.4	4.03	0.16	0.085	0.035	0.004	15.6545	7.8955	97.3	2.7		932	
H	0.023	0.25	0.33	0.01	0.002	12.9	4.19	0.26	0.065	0.056	0.005	15.3195	7.4085	98.6	1.4		974	
I	0.022	0.3	0.62	0.02	0.001	13.8	3.68	0.91	0.037	0.028	0.003	16.298	9.663	94.1	5.9		911	
J	0.011	0.24	0.49	0.02	0.001	13.6	5.51	0.64	0.051	0.046	0.003	17.5325	7.6115	97.5	2.5		967	0.34
K	0.023	0.24	0.39	0.02	0.002	13.1	0.76	0.75	0.01	0.061	0.001	13.584	11.457	100			939	
L	0.026	0.26	0.41	0.01	0.001	10.4	3.09	0.45	0.047	0.037	0.004	12.1585	6.21	89.7	10.3		933	
M	0.059	0.31	0.46	0.02	0.001	12.6	3.55	0.77	0.031	0.018	0.003	14.1895	7.0005	86.8	13.2		843	
N	0.027	0.21	0.46	0.02	0.001	13.5	1.53	0.47	0.018	0.026	0.004	14.2365	10.911	100	0		932	
O	0.026	0.34	0.44	0.02	0.001	13.4	4.97	0.18	0.046	0.012	0.004	16.2185	7.297	87.6	12.4		838	
P	0.028	0.21	0.43	0.01	0.001	13	2.15	1.45	0.055	0.078	0.002	14.7075	10.271	99.5	0.5		961	
Q	0.017	0.26	0.41	0.02	0.001	13.3	4.33	0.97	0.051	0.029	0.003	16.3565	8.8535	96.9	3.1		938	
R	0.018	0.21	0.47	0.01	0.001	12.9	4.06	1.01	0.064	0.031	0.003	15.785	8.663	96.4	3.6		917	
S	0.024	0.23	0.43	0.01	0.001	12.6	4.14	0.92	0.032	0.046	0.003	15.7095	7.63	97.3	2.7		946	0.63
T	0.02	0.28	0.5	0.02	0.001	13.2	4.1	1.05	0.069	0.079	0.004	16.3755	8.3	97.9	2.1		965	0.51